

ADVANCES IN ANALYTICAL CELLULAR PATHOLOGY

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INTERPHASE CYTOGENETICS OF PRECANCEROUS AND NEOPLASTIC HUMAN TESTICULAR GERM CELLS

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INTRODUCTION

The usefulness of a new approach, termed interphase cytogenetics (1), was recently demonstrated in studies of malignant solid tumors by the detection of numerical and structural aberrations of specific chromosomes in nuclei from in vitro cultivated neuroectodermal tumor cell lines (2). We applied this approach to paraffin-embedded tissue sections using a biotin-labeled DNA probe, specific for 1q12 (3), to investigate whether a numerical aberration of this region is also present in primary surgical tumor tissue and in precancerous cells (carcinoma-in-situ, CIS). Furthermore a protocol for the in situ hybridization of the 1q12-specific probe to isolated nuclei in suspension allowed us to investigate premeiotic germ cells, present in semen from patients with fertility problems or manifest germ cell tumors.

MATERIAL AND METHODS

They were described elsewhere:

Xenografts. Walt et al. (4).

Cell cultures. Hofmann et al. (5).

Preparation of semen samples. Jauch et al. (6).

Tissue preparation. Emmerich et al. (7).

DNA probe. Cooke and Hindley (3).

Hybridization techniques. Jauch et al. (6), Emmerich et al. (7).

RESULTS AND DISCUSSION

Metaphase spreads and interphase nuclei from cell lines of testicular tumors showed in 80% three hybridization signals (Fig. 1a). In tissue sections from corresponding xenografts, trisomy for the region 1q12 could be confirmed (Fig. 1b). In situ investigations of primary tissue from patients with germ cell tumors showed that both tumor cells and CIS cells, found adjacent to the manifest tumor, often (CIS 30%) contained nuclei with three hybridization signals (Fig. 1c,d).

With above approaches we hope to establish new avenues in order to recognize earliest stages of human testicular germ cell tumors.

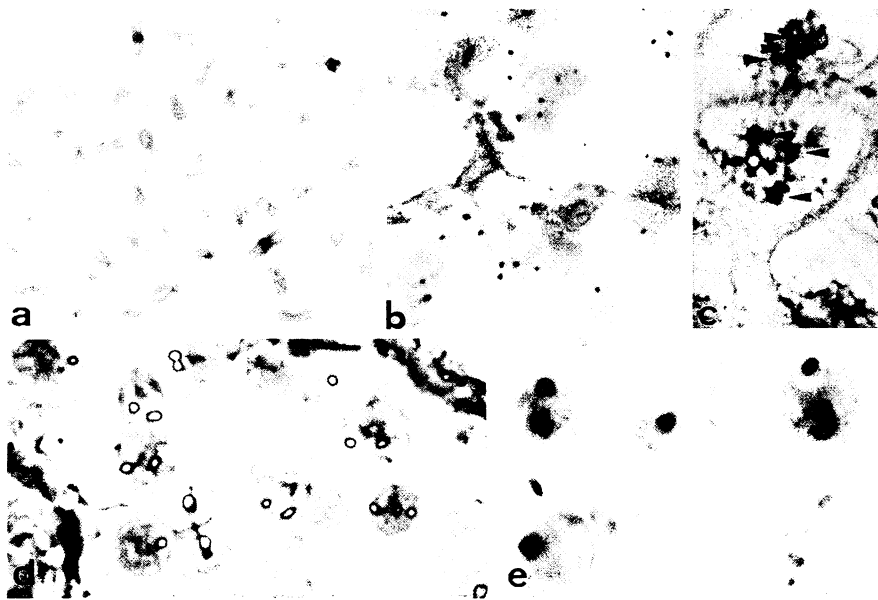


Fig. 1a-e. Various specimens after in situ hybridization with biotinylated probe pUC1.77 and peroxidase-detection. a: Metaphase of a malignant testicular germ cell from a tumor cell line. b-d: Paraffinsection through a xenograft (b); a human testicular teratocarcinoma (cartilage, c); a seminiferous tubule with CIS (d). e: Exfoliated premeiotic germ cells from semen of a patient with Oligo-astheno-terato-zoospermia. All specimens show cells with increased numbers of chromosome 1.

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